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Mr. Donald Silawsky
Department of Energy
Office of Petroleum Reserves
1000 Independence Avenue, S.W.
Washington, DC 20585-0301

Re: Proposed Expansion of the Strategic Petroleum Reserve

Mr. Silawsky:

This letter is in response to your request via letter dated September 9, 2005 for natural resource information and potential Texas Parks & Wildlife Department (TPWD) concerns regarding the potential Texas sites for expansion of the Strategic Petroleum Reserve. These sites include a potential new site in Stratton Ridge in Brazoria County and expansion of the Big Hill site in Jefferson County. Department staff met with your representatives from ICF Consulting on October 5, 2005 and therefore these comments may reiterate Department concerns expressed in that meeting.

The information provided to TPWD regarding the Stratton Ridge site at this point has been preliminary; with no defined pipeline routes and no current site information. It is the understanding of TPWD staff that the expansion of the Big Hill site may require new pipeline installation or replacement. Due to the preliminary nature of the information provided, Department concerns expressed herein are preliminary and the Department of Energy should continue ongoing coordination with TPWD as new information is made available. The following comments will fall into two broad categories; rare natural resources and general natural resource concerns.

ENJOY THE TEXAS OUTDOORS!

Take a kid hunting or fishing

• ● •

Visit a state park or historic site

Rare Natural Resources

Given the small proportion of public versus private land in Texas, the TPWD Natural Diversity Database (NDD) (formerly the Biological and Conservation Data System) does not include a representative inventory of rare resources in the state. Although it is based on the best data available to TPWD regarding rare species, the data from the NDD does not provide a definitive statement as to the presence, absence, or condition of special species, natural communities, or other significant features within your project areas. This data cannot substitute for an on-site evaluation by your qualified biologists. The NDD information is intended to assist you in avoiding harm to species that may occur on your sites.

Currently in the NDD, the following species, special features, natural communities, and managed areas have been documented in the general area of the petroleum reserve sites and their estimated pipeline routes:

Big Hill Site

Federal and State Listed Threatened

Piping Plover (*Charadrius melodus*)

Species of Concern
Pig frog (*Rana grylio*)
Gulf saltmarsh snake (*Nerodia clarkii*)
Texas diamondback terrapin (*Malaclemys terrapin littoralis*)
Correll's false dragon-head (*Physostegia correllii*)

Special Features and Natural Communities
Colonial Waterbird Rookeries
Migratory Songbird Fallout Areas
Coastal Live Oak-Pecan (*Quercus virginiana-Carya illinoinensis*) Series
Little Bluestem-Brownseed Paspalum (*Schizachyrium scoparium-Paspalum plicatulum*) Series
Marshhay Cordgrass (*Spartina patens*) Series
Rush-Sedge (*Juncus* spp.) Series
Seacoast Bluestem-Gulfdune Paspalum (*Schizachyrium scoparium* var. *littoralis-Paspalum monostachyum*) Series
Sea Oats-Bitter Panicum (*Uniola paniculata-Panicum amarum*) Series
Smooth Cordgrass (*Spartina alterniflora*) Series

Managed Areas
JD Murphree Wildlife Management Area
Sea Rim State Park
McFaddin National Wildlife Refuge
Anahuac National Wildlife Refuge

Stratton Ridge Site

Federal and State Listed Endangered
Attwater's Greater Prairie Chicken (*Tympanuchus cupido attwateri*)
Whooping Crane (*Grus americana*)
Jaguarundi (*Herpailurus yaguarondi*)
Kemp's ridley sea turtle (*Lepidochelys kempii*)

Federal and State Listed Threatened (Federal Proposed for Delisting)
Bald Eagle (*Haliaeetus leucocephalus*)

Federal and State Listed Threatened
Piping Plover (*Charadrius melodus*)

Species of Concern
Texas diamondback terrapin (*Malaclemys terrapin littoralis*)

Gulf saltmarsh snake (*Nerodia clarkii*)
Coastal gay-feather (*Liatris bracteata*)
Grand Prairie evening primrose (*Oenothera pilosella* ssp. *sessilis*)
Houston daisy (*Rayjacksonia aurea*)
Runyon's water-willow (*Justicia runyonii*)
Texas windmill-grass (*Chloris texensis*)
Threeflower broomweed (*Thurovia triflora*)

Special Features and Natural Communities
Colonial Waterbird Rookeries
Migratory Songbird Fallout Areas
Coastal Live Oak-Pecan (*Quercus virginiana-Carya illinoinensis*) Series
Glasswort-Saltwort (*Salicornia bigelovii/S. virginica-Batis maritima*) Series
Little Bluestem-Brownseed Paspalum (*Schizachyrium scoparium-Paspalum plicatulum*) Series
Marshhay Cordgrass (*Spartina patens*) Series
Saltgrass-Cordgrass (*Distichlis spicata-Spartina* spp.) Series
Seacoast Bluestem-Gulfdune Paspalum (*Schizachyrium scoparium* var. *littoralis-Paspalum monostachyum*) Series
Sea Oats-Bitter Panicum (*Uniola paniculata-Panicum amarum*) Series
Smooth Cordgrass (*Spartina alterniflora*) Series
Water Oak-Coastal Live Oak (*Quercus nigra-Quercus virginiana*) Series

Managed Areas
Brazoria National Wildlife Refuge
Peach Point Wildlife Management Area
San Bernard National Wildlife Refuge

The proposed Stratton Ridge site is located within a Bald Eagle nesting territory. A printout for this occurrence record is included for your planning reference. **Please do not include NDD occurrence printouts in your draft or final documents.** Because some species are especially sensitive to collection or harassment, this record is for your reference only. Brent Ortego, TPWD regional biologist, may be contacted at [redacted] for information on the current season's nesting activities for Bald Eagles.

Please note that because the exact pipeline routes were not shown on the maps provided, species occurrences along the pipeline routes are not known. However, this response includes occurrences in the general area of estimated pipeline routes. The pipeline from the Big Hill site to Nederland could potentially run across or adjacent to the JD Murphree Wildlife Management Area (WMA) and the raw water intake and/or brine disposal pipelines could cross the McFaddin National Wildlife Refuge. Occurrences on or within 1.5 miles of the estimated route of the Stratton Ridge pipelines in Brazoria and Galveston counties include the Whooping Crane, Jaguarundi, Coastal gay-feather, Runyon's water willow,

Threeflower broomweed, Colonial Waterbird Rookeries, Marshhay Cordgrass Series, Little Bluestem-Brownseed Paspalum Series, and the Seacoast Bluestem-Gulfdune Paspalum Series. This route could also cross the Brazoria National Wildlife Refuge, and Bryan Mound is less than .75 mile from Peach Point Wildlife Management Area. For more site-specific data, please include a map of any crude oil distribution, brine disposal, and raw water pipelines that are proposed to be constructed or replaced, as well as any proposed ponds, in the Environmental Impact Statement (EIS). Additionally, should the proposed pipeline routes cross or run adjacent to any of the Department's holdings, you will need to address the routes with Dennis Gissell, TPWD WMA coordinator, at [redacted].

Enclosed are updated TPWD lists of rare, threatened, and endangered species for Brazoria, Galveston, and Jefferson Counties. When additional information becomes available, please use these lists and the enclosed Rare Resources Review Request form for your analysis and as guidance during preparation of your EIS.

General Natural Resource Concerns

Big Hill Site

The major potential impact regarding the Big Hill site expansion arises from the need to replace the 24 mile long crude oil distribution pipeline between the Big Hill site and refineries in Nederland, Texas. Permanent wetland impacts from pipeline installation has been well documented (Polasek, 1997). Although the proposed pipeline will follow existing rights-of-way, there will likely be additional wetland impacts from installation. TPWD recommends proposed rights-of-way and work corridors be minimized for all pipeline installation through wetlands and other sensitive habitat. TPWD also recommends the use of the enclosed pipeline monitoring procedures that were developed in concert with the United States Fish and Wildlife Service and the National Marine Fisheries Service.

Stratton Ridge

Aerial photography and National Wetland Inventory data regarding the Stratton Ridge site indicate the presence of the forested wetlands throughout the site. All wetland impacts should be minimized to the greatest extent practicable. Also, all proposed pipeline corridors should be coordinated with TPWD staff when that information becomes available. The selected route should be monitored utilizing the monitoring criteria referenced in the above section. All wetland impacts should be adequately compensated for to ensure a no net loss of wetland functions. This should include all wetlands that may be deemed "isolated" by the Galveston District of the United States Army Corps of Engineers. These wetlands play a critical role maintaining water quality in streams by intercepting and assimilating pollutants, sediments and excess nutrients prior to their entrance into downstream receiving waters. These wetlands are also critical wildlife habitat

and play a crucial role in various animal life histories including that of the endemic mottled duck (*Anas fulvigula*). Upon finalization of wetland impact assessment, TPWD staff is willing to assist Department of Energy representatives to formulate a mitigation plan that adequately compensates all unavoidable wetland impacts.

TPWD recommends that the Department of Energy explore the use of water from Dow Energy Plant outfall in Freeport as a raw water source for cavern leaching. This may minimize habitat impacts with the proposed raw water uptake facility and pipeline that appears to cross the Brazoria National Wildlife Refuge.

The development of the Environmental Impact Statements should include a thorough cumulative impact analysis that considers the impacts from the proposed action and past and future similar actions. Similar actions in the region of the proposed sites should include all pipeline installations and development of liquid natural gas import terminals and associated pipelines in the vicinity of these sites.

Texas Parks and Wildlife staff appreciates the opportunity to provide input into the early stage of this project and looks forward to continued coordination to ensure impacts to Texas natural resources are adequately mitigated. Questions can be directed to Jamie Schubert of the Upper Coast Conservation Program in Dickinson at [redacted].

Sincerely,

Jarrett (Woody) Woodrow.
Director of Coastal Conservation Program
Coastal Fisheries Division

JOW:WJS

Enclosures 2

JEFFERSON COUNTY

	Federal Status	State Status

******* DRAFT ***** DRAFT ***** DRAFT***** DRAFT ***** DRAFT ***** DRAFT*******
UNDER CONSTRUCTION ** SPECIES MIGHT BE ADDED/DELETED DURING QUALITY CONTROL**

*** AMPHIBIANS ***

Pig Frog (*Rana grylio*) – prefers permanent bodies of open water with emergent vegetation; actively mainly at night; eats insects and crustaceans; mating and egg-laying March-September; male vocalization a pig-like grunt		

*** BIRDS ***

Arctic Peregrine Falcon (*Falco peregrinus tundrius*) - potential migrant	DL	T
Bachman's Sparrow (*Aimophila aestivalis*) - inhabits mature open pine forests with grassy understory, regenerating pine clear-cuts (1-7 years post re-planting), or open habitats with a dense ground cover of grasses and forbs, or palmetto scrub; in Texas, known to occur only in the far eastern portion of the state; most abundant in forests south of Angelina National Forest		T
Bald Eagle (*Haliaeetus leucocephalus*) - found primarily near seacoasts, rivers, and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds	LT-PDL	T
Brown Pelican (*Pelecanus occidentalis*) - largely coastal and near shore areas, where it roosts on islands and spoil banks	LE	E
Henslow's Sparrow (*Ammodramus henslowii*) – wintering individuals (not flocks) found in weedy fields or cut-over areas where lots of bunch grasses occur along with vines and brambles; a key component is bare ground for running/walking		
Piping Plover (*Charadrius melodus*) - wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats	LT	T
Reddish Egret (*Egretta rufescens*) - resident of the Texas Gulf Coast; brackish marshes and shallow salt ponds and tidal flats; nests on ground or in trees or bushes, on dry coastal islands in brushy thickets of yucca and prickly pear		T
Snowy Plover (*Charadrius alexandrinus*) – wintering migrant along the Texas Gulf Coast beaches and bayside mud or salt flats		
Sooty Tern (*Sterna fuscata*) – predominately "on the wing"; does not dive, but snatches small fish and squid with bill as it flies or hovers over water; breeding April-July		T
Swallow-tailed Kite (*Elanoides forficatus*) - lowland forested regions, especially swampy areas, ranging into open woodland; marshes, along rivers, lakes, and ponds; nests high in tall tree in clearing or on forest woodland edge, usually in pine, cypress, or various deciduous trees		T
White-faced Ibis (*Plegadis chihi*) - prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats		T
Wood Stork (*Mycteria americana*) - forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-water; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960		T

	Federal Status	State Status
***** BIRDS-RELATED *****		
Colonial waterbird nesting areas - many rookeries active annually		
Migratory songbird fallout areas - oak mottes and other woods/thickets provide foraging/roosting sites for neotropical migratory songbirds		
*****FISHES*****		
American Eel (*Anguilla rostrata*) - most aquatic habitats with access to ocean; spawns January-February in ocean, larva move to coastal waters, metamorphose, then females move into freshwater; muddy bottoms, still waters, large streams, lakes; can travel overland in wet areas; males in brackish estuaries		
***** MAMMALS *****		
Black Bear (*Ursus americanus*) - within historical range of Louisiana Black Bear in eastern Texas, Black Bear is federally listed threatened and inhabits bottomland hardwoods and large tracts of undeveloped forested areas; in remainder of Texas, Black Bear is not federally listed and inhabits desert lowlands and high elevation forests and woodlands; dens in tree hollows, rock piles, cliff overhangs, caves, or under brush piles	T/SA; NL	T
Louisiana Black Bear (*Ursus americanus luteolus*) - possible as transient; bottomland hardwoods and large tracts of inaccessible forested areas	LT	T
Plains Spotted Skunk (*Spilogale putorius interrupta*) – catholic; in habitat; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie		
Rafinesque's Big-eared Bat (*Corynorhinus rafinesquii*) - roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures		T
Red Wolf (*Canis rufus*) (extirpated) - formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies	LE	E
Southeastern Myotis Bat (*Myotis austroriparius*) - roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures		
*****MOLLUSKS*****		
Creeper (Squawfoot) (*Strophitus undulatus*) - small to large streams, prefers gravel or gravel and mud in flowing water; Colorado, Guadalupe, San Antonio, Neches (historic), and Trinity (historic) River basins		
Fawnsfoot (Common) (*Truncilla donaciformis*) - small and large rivers especially on sand, mud, rocky mud, and sand and gravel, also silt and cobble bottoms in still to swiftly flowing waters; Red (historic), Cypress (historic), Sabine (historic), Neches, Trinity, and San Jacinto River basins.		
Little Spectaclecase (*Villosa lienosa*) - creeks, rivers, and reservoirs, sandy substrates in slight to moderate current, usually along the banks in slower currents; east Texas, Cypress through San Jacinto River basins		
Louisiana Pigtoe (*Pleurobema riddellii*) - streams and moderate-size rivers, usually flowing water on substrates of mud, sand, and gravel; not generally known from impoundments; Sabine, Neches, and Trinity (historic) River basins		
Pistolgrip (*Tritogonia verrucosa*) - stable substrate, rock, hard mud, silt, and soft bottoms, often buried deeply; east and central Texas, Red through San Antonio River basins		

	Federal Status	State Status
Rock-pocketbook (*Arcidens confragosus*) - mud, sand, and gravel substrates of medium to large rivers in standing or slow flowing water, may tolerate moderate currents and some reservoirs, east Texas, Red through Guadalupe River basins		
Sandbank Pocketbook *(Lampsilis satura*) - small to large rivers with moderate flows and swift current on gravel, gravel-sand, and sand bottoms; east Texas, Big Cypress Bayou south through San Jacinto River basins; Neches River		
Southern Hickorynut *(Obovaria jacksoniana*) - medium sized gravel substrates with low to moderate current; Neches, Sabine, and Cypress river basins		
Texas Heelsplitter *(Potamilus amphichaenus*) - quiet waters in mud or sand and also in reservoirs. Sabine, Neches, and Trinity River basins		
Texas Pigtoe (*Fusconaia askewi*) - rivers with mixed mud, sand, and fine gravel in protected areas associated with fallen trees or other structures; east Texas River basins, Sabine through Trinity rivers as well as San Jacinto River		
Wabash Pigtoe (*Fusconaia flava*) – creeks to large rivers on mud, sand, and gravel from all habitats except deep shifting sands; found in moderate to swift current velocities; east Texas River basins, Red through San Jacinto River basins; elsewhere occurs in reservoirs and lakes with no flow		
Wartyback *(Quadrula nodulata*) - gravel and sand-gravel bottoms in medium to large rivers and on mud; Red, Sabine, Neches River basins		
***** REPTILES *****		
Alligator Snapping Turtle (*Macrochelys temminckii*) - deep water of rivers, canals, lakes, and oxbows; also swamps, bayous, and ponds near deep running water; sometimes enters brackish coastal waters; usually in water with mud bottom and abundant aquatic vegetation; may migrate several miles along rivers; active March-October; breeds April-October		T
Atlantic Hawksbill Sea Turtle *(Eretmochelys imbricata*) - Gulf and bay system	LE	E
Green Sea Turtle *(Chelonia mydas*) – Gulf and bay system	LT	T
Gulf Saltmarsh Snake (*Nerodia clarkii*) - saline flats, coastal bays, & brackish river mouths		
Kemp's Ridley Sea Turtle *(Lepidochelys kempii*) - Gulf and bay system	LE	E
Leatherback Sea Turtle *(Dermochelys coriacea*) - Gulf and bay system	LE	E
Loggerhead Sea Turtle *(Caretta caretta*) - Gulf and bay system	LT	T
Northern Scarlet Snake (*Cemophora coccinea copei*) - mixed hardwood scrub on sandy soils; feeds on reptile eggs; semi-fossorial; active April-September		T
Texas Diamondback Terrapin (*Malaclemys terrapin littoralis*) - coastal marshes, tidal flats, coves, estuaries, and lagoons behind barrier beaches; brackish and salt water; burrows into mud when inactive; may venture into lowlands at high tide		
Texas Horned Lizard (*Phrynosoma cornutum*) - open, arid and semi-arid regions with sparse vegetation, which could include grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September		T
Timber/Canebrake Rattlesnake (*Crotalus horridus*) - swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil or black clay; prefers dense ground cover, i.e. grapevines or palmetto		T
***** VASCULAR PLANTS *****		

	Federal Status	State Status

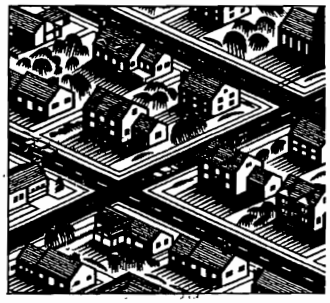
Chapman's orchid (*Platanthera chapmanii*) - in Texas, restricted to wetland pine savannas, one of the states most endangered habitats; flowering July-August

Status Key:

- LE, LT - Federally Listed Endangered/Threatened
- PE, PT - Federally Proposed Endangered/Threatened
- E/SA, T/SA - Federally Listed Endangered/Threatened by Similarity of Appearance
- C1 - Federal Candidate for Listing, Category 1; information supports proposing to list as endangered/threatened
- DL, PDL - Federally Delisted/Proposed for Delisting
- NL - Not Federally Listed
- E, T - State Listed Endangered/Threatened
- "blank" - Rare, but with no regulatory listing status

Species appearing on these lists do not all share the same probability of occurrence. Some species are migrants or wintering residents only, or may be historic or considered extirpated.

TEXAS PARKS AND WILDLIFE



Wildlife Habitat Assessment Program
Threatened and Endangered Species
3000 S. IH-35, Suite 100
Austin, Texas 78704
512/912-7011 phone
512/912-7058 fax
www.tpwd.state.tx.us

Rare Resources Review Requests
(Including Threatened and Endangered Species)

This service includes an analysis of your site-specific assessment of environmental information and potential impacts to threatened, endangered, and other rare species, natural communities, and special features presently known or potentially occurring in the vicinity of a project. **If you need only state or county rare species lists for preliminary project planning, in lieu of submitting this form please contact our administrative staff at** [redacted].

Review requests for this analysis should include all the information listed on Page 2 below and be sent to the attention of Celeste Brancel at the above address. We will provide you an analysis based on the most current information available to Texas Parks and Wildlife Department regarding sensitive natural resources. Please expect our response to take on average 4 to 6 weeks from receipt, depending on the size of your request. Note the more pertinent information you provide, the more customized our review, and the faster our turnaround. Review requests submitted without adequate project detail may cause a delay in our response while we contact you and wait for supplemental information. The potential for adverse impacts to rare resources from project activities varies based on the type of activity; location; season; vegetation; present physical features (both natural and man-made); degree of disturbance; planned avoidance, minimization, mitigation, enhancement, and restoration measures; and species-specific tolerance levels. Current site color photographs and aerial photographs greatly facilitate the review process. More information allows us to more accurately assess a project's potential impacts as well as assists in narrowing the list of species or impacts you and we would need to address.

TPWD charges for this review service. Since TPWD is largely a self-funded agency, this revenue allows for additional staff to provide more timely responses to review requests! The charges are based on a flat fee (minimum charge of $50/project site), except when the project is unusually large ($25/additional hour). An invoice will accompany the TPWD response letter for the review request, which will be due upon receipt; please do not prepay. Government agencies are exempted from these charges. Private consultants performing work under contract for government entities are not exempt.

This analysis does not include a review of general fish and wildlife habitat impacts (such as impacts to wetlands, water bodies, other fish and wildlife species, forests, parklands, etc.). Should you need such a review, a separate request should be sent to Kathy Boydston, TPWD Wildlife Division, Wildlife Habitat Assessment Program, [redacted]

- Rare Resources Review Requests
- (Including Threatened and Endangered Species), cont'd. -

If this form is filled out electronically, please use a font or style that will contrast with the text below. If sending in a separate attachment, it is not necessary to return the blank form, providing all the information below is included on the attachment.

Name:	Date:
Your Company:	Phone:
Your Company Address:	Fax:
City, State, Zip:	E-Mail:
Project Title & Site Location:	County(ies):

1) **Scope of Project**
   a) What regulations will this review help you to comply with? OR If not regulatory, why is the review being requested?
   b) What activities will be conducted at the site? (Especially activity types, extent, and acreage of ground, waterway, and vegetation disturbance and total acreage of site)
   c) Schedule of activities – Approximately when will the project be active on the site?

2) **Vegetation** - Species, structure and composition, vegetation layers, height of layers, natural vegetation community type

3) **Other Natural Resources/Physical Features**
   a) Soils and geology
   b) Habitat, watercourses, animals, etc.

4) **Existing Site Development** - Extent of pavement, gravel, shell, or other cover; buildings, landscaped, xeriscaped, drainage system, etc).

5) **Historic Use/Function of Site** – Pasture, forest, urban, row crops, rangeland, wetland, etc.

6) **Has a threatened and endangered species survey or assessment already been performed? (In general, TPWD recommends an on-site habitat assessment be performed).**
   a) If yes, provide surveyor name, qualifications, methods or protocols, acreage surveyed, level of effort, weather conditions, time of day, and dates the survey was performed.
   b) If yes, please provide results and copy of survey/assessment report.

7) **Could current on-site or adjacent habitat support rare species?** Specifically, explain why or why not.

8) **Brief description of potential negative impacts** from project activities and avoidance, minimization, and mitigation measures planned.

9) **Brief description of planned beneficial enhancements** or restoration efforts.

10) **Clearly delineate exact location of site** on original or photocopy of relevant portion of USGS 7.5' topographic quadrangle (most preferable) or best map available. Topographic map should show name of quadrangle. The map must contain identifiable features and a scale that allows us to accurately pinpoint your site.

11) **Originals or color-copy photographs** of site and surrounding area with captions or narratives.

12) **Aerial photographs** when available. Aerials should show the year photograph was taken.

Notes for
County Lists of Texas' Special Species

The Texas Parks and Wildlife (TPWD) county lists **include**:

- **Vertebrates, Invertebrates, and Vascular Plants** on the special species lists of the TPWD, Non-game and Rare Species Program, Natural Diversity Database (NDD) (formerly the Biological and Conservation Data System). These special species lists are comprised of all species, subspecies, and varieties that are federally listed; proposed to be federally listed; have federal candidate status; are state listed; or carry a global conservation status indicating a species is imperiled, very rare, vulnerable to extirpation; and some species ranked rare or uncommon.
- **Colonial Waterbird Nesting Areas and Migratory Songbird Fallout Areas** are included on the county lists for coastal counties only.

The TPWD county lists **exclude**:

- **Natural Plant Communities** such as Little Bluestem-Indiangrass Series (native prairie remnant), Water Oak-Willow Oak Series (bottomland hardwood community), Saltgrass-Cordgrass Series (salt or brackish marsh), Sphagnum-Beakrush Series (seepage bog).
- **Other Significant Features** such as non-coastal bird rookeries, comprehensive migratory bird information, bat roosts, bat caves, invertebrate caves, and prairie dog towns.

These lists are not all inclusive for all rare species distributions. The lists were developed and are updated based on field guides, NDD occurrences data, staff expertise, and scientific publications. In order to keep the lists to a reasonable length, historic ranges for some state extirpated species, full historic distributions for some extant species, accidentals and irregularly appearing species, and portions of migratory routes for particular species are not included.

The **revised date** on each county list reflects the last date any changes or revisions were made for that county and reflects current listing statuses and taxonomy.

Species that appear on county lists do not all share the same probability of occurrence within a county. Some species are migrants or wintering residents only. Additionally, a few species may be historic or considered extirpated within a county. Species considered extirpated within the state are so flagged on each list.

The Natural Diversity Database

The Texas Parks and Wildlife Department (TPWD), Natural Diversity Database (NDD) (formerly the Biological and Conservation Data System), established in 1983, is the Department's most comprehensive source of information on rare, threatened, and endangered plants and animals, exemplary natural communities, and other significant features. Though it is not all-inclusive, the NDD is constantly updated, providing current or additional information on statewide status and locations of these unique elements of natural diversity.

The NDD gathers biological information from museum and herbarium collection records, peer reviewed publications, experts in the scientific community, organizations, qualified individuals, and on-site field surveys conducted by TPWD staff on public lands or private lands with written permission. TPWD staff botanists, zoologists, and ecologists perform field surveys to locate and verify specific occurrences of high-priority biological elements and collect accurate information on their condition, quality, and management needs.

The NDD can be used to help evaluate the environmental impacts of routing and siting options for development projects. It also assists in impact assessment, environmental review, and permit review.

Given the small proportion of public versus private land in Texas, the NDD does not include a representative inventory of rare resources in the state. Although it is based on the best data publicly available to TPWD regarding rare species, these data cannot provide a definitive statement as to the presence, absence, or condition of special species, natural communities, or other significant features in any area. Nor can these data substitute for on-site evaluation by qualified biologists. The NDD information is intended to assist the user in avoiding harm to species that may occur.

Please use the following citation to credit the source for this county level information:

> Texas Parks and Wildlife Department, Wildlife Division, Non-game and Rare Species and Habitat Assessment programs. County Lists of Texas' Special Species. [county name(s) and revised date(s)].

For information on obtaining a project review form or a site-specific review of a project area for rare species, and for updated county lists, please call [redacted]

Code Key for Printouts from
Texas Parks and Wildlife Department
Natural Diversity Database (NDD)

This information is for your assistance only; due to continuing data updates, vulnerability of private land to trespass and of species to disturbance or collection, **please do not publish in public documents or otherwise reprint or redistribute the information, instead refer all requesters to our office to obtain the most current information available.**

LEGAL STATUS AND CONSERVATION RANKS

FEDERAL STATUS (as determined by the US Fish and Wildlife Service)

LE	Listed Endangered
LT	Listed Threatened
PE	Proposed to be listed Endangered
PT	Proposed to be listed Threatened
PDL	Proposed to be Delisted (Note: Listing status retained while proposed)
E/SA, T/SA	Listed Endangered on basis of Similarity of Appearance, Listed Threatened on basis of Similarity of Appearance
DL	Delisted Endangered/Threatened
C1	Candidate, Category 1. USFWS has substantial information on biological vulnerability and threats to support proposing to list as threatened or endangered. Data are being gathered on habitat needs and/or critical habitat designations.
C1*	C1, but lacking known occurrences
C1**	C1, but lacking known occurrences, except in captivity/cultivation
XE	Essential Experimental Population
XN	Non-essential Experimental Population
Blank	Species is not federally listed

TX PROTECTION (as determined by the Texas Parks and Wildlife Department)

E	Listed Endangered
T	Listed Threatened
Blank	Species not state-listed

GLOBAL RANK (as determined by NatureServe)

G1	Critically imperiled globally, extremely rare, typically 5 or fewer viable occurrences
G2	Imperiled globally, very rare, typically 6 to 20 viable occurrences
G3	Very rare and local throughout range or found locally in restricted range, typically 21 to 100 viable occurrences
G4	Apparently secure globally
G5	Demonstrably secure globally
GH	Of historical occurrence through its range
GU	Possibly in peril range-wide, but status uncertain
G#G#	Ranked within a range as status uncertain
GX	Apparently extinct throughout range
Q	Rank qualifier denoting taxonomic assignment is questionable
#?	Rank qualifier denoting uncertain rank
C	In captivity or cultivation only
G#T#	"G" refers to species rank; "T" refers to variety or subspecies rank

STATE (SUBNATIONAL) RANK (as determined by the Texas Parks and Wildlife Department)

S1	Critically imperiled in state, extremely rare, vulnerable to extirpation, typically 5 or fewer viable occurrences
S2	Imperiled in state, very rare, vulnerable to extirpation, typically 6 to 20 viable occurrences
S3	Rare or uncommon in state, typically 21 to 100 viable occurrences
S4	Apparently secure in State
S5	Demonstrably secure in State
S#S#	Ranked within a range as status uncertain
SH	Of historical occurrence in state and may be rediscovered
SU	Unrankable – due to lack of information or substantially conflicting information
SX	Apparently extirpated from State
SNR	Unranked – State status not yet assessed
SNA	Not applicable – species id not a suitable target for conservation activities
?	Rank qualifier denoting uncertain rank in State

ELEMENT OCCURRENCE RECORD

Element Occurrence Record (EOR) Spatial and tabular record of an area of land and/or water in which a species, natural community, or other significant feature of natural diversity is, or was, present and associated information; may be a single contiguous area or may be comprised of discrete patches or subpopulations

Occurrence # Unique number assigned to each occurrence of each element when added to the NDD

LOCATION INFORMATION

Watershed Code Eight digit numerical code determined by US Geological Survey (USGS)

Watershed Name of watershed as determined by USGS

Quadrangle Name of USGS topographical map

Directions Directions to geographic location where occurrence was observed, as described by observer or in source

SURVEY INFORMATION

First/Last Observation Date a particular occurrence was first/last observed; refers only to species occurrence as noted in source and does not imply the first/last date the species was present

Survey Date If conducted, date of survey

EO Type State rank qualifiers:

- **M** Migrant – species occurring regularly on migration at staging areas, or concentration along particular corridors; status refers to the transient population in the State
- **B** Qualifier indicating basic rank refers to the breeding population in State
- **N** Qualifier indicating basic rank refers to the non-breeding population in State

EO Rank

A	Excellent	**AI**	Excellent, Introduced
B	Good	**BI**	Good, Introduced
C	Marginal	**CI**	Marginal, Introduced
D	Poor	**DI**	Poor, Introduced
E	Extant/Present	**EI**	Extant, Introduced
H	Historical/No Field Information	**HI**	Historical, Introduced
X	Destroyed/Extirpated	**XI**	Destroyed, Introduced
O	Obscure	**OI**	Obscure, Introduced

EO Rank Date Latest date EO rank was determined or revised

Observed Area Acres, unless indicated otherwise

COMMENTS

Description General physical description of area and habitat where occurrence is located, including associated species, soils, geology, and surrounding land use

Comments Comments concerning the quality or condition of the element occurrence at time of survey

Protection Comments Observer comments concerning legal protection of the occurrence

Management Comments Observer comments concerning management recommendations appropriate for occurrence conservation

DATA

EO Data Biological data; may include number of individuals, vigor, flowering/fruiting data, nest success, behaviors observed, or unusual characteristic, etc.

SITE

Site Name Title given to site by surveyor

MANAGED AREA INFORMATION

Managed Area Name Place name or (on EOR printout) name of area when the EO is located within or partially within an area identified for conservation, such as State or Federal lands, nature preserves, parks, etc.

Alias Additional names the property is known by

Acres Total acreage of property, including non-contiguous tracts

Manager Contact name, address, and telephone number for area or nearest area land steward

Please use the following citation to credit the source for the printout information:

Texas Parks and Wildlife Department, Wildlife Division, Science, Research, and Diversity Program, Natural Diversity Database [date(s) posted on printouts].

BRAZORIA COUNTY

	Federal Status	State Status
***** BIRDS *****		
Arctic Peregrine Falcon (*Falco peregrinus tundrius*) - potential migrant	DL	T
Attwater's Greater Prairie-chicken (*Tympanuchus cupido attwateri*) - county within historical distribution; open prairies of mostly thick grass one to three feet tall; from near sea level to 200 feet along coastal plain on upper two-thirds of Texas coast; males form communal display flocks during late winter-early spring; booming grounds important; breeding February-July	LE	E
Bald Eagle (*Haliaeetus leucocephalus*) - found primarily near seacoasts, rivers, and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds	LT-PDL	T
Black Rail (*Laterallus jamaicensis*) - salt, brackish, and freshwater marshes; pond borders, wet meadows, & grassy swamps; nests in or along edge of marsh, sometimes on damp ground, but usually on mat of previous year's dead grasses; nest usually hidden in marsh grass or at base of Salicornia		
Brown Pelican (*Pelecanus occidentalis*) - largely coastal and near shore areas, where it roosts on islands and spoil banks	LE	E
Henslow's Sparrow (*Ammodramus henslowii*) - wintering individuals (not flocks) found in weedy fields or cut-over areas where lots of bunch grasses occur along with vines and brambles; a key component is bare ground for running/walking; likely to occur, but few records within this county		
Mountain Plover (*Charadrius montanus*) - shortgrass plains and plowed fields (bare, dirt fields); primarily insectivorous; winter resident in this area		
Piping Plover (*Charadrius melodus*) - wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats	LT	T
Reddish Egret (*Egretta rufescens*) - resident of the Texas Gulf Coast; brackish marshes and shallow salt ponds and tidal flats; nests on ground or in trees or bushes, on dry coastal islands in brushy thickets of yucca and prickly pear		T
Snowy Plover (*Charadrius alexandrinus*) - wintering migrant along the Texas Gulf Coast beaches and bayside mud or salt flats		
Sooty Tern (*Sterna fuscata*) - predominately "on the wing"; does not dive, but snatches small fish and squid with bill as it flies or hovers over water; breeding April-July		T
Swallow-tailed Kite (*Elanoides forficatus*) - lowland forested regions, especially swampy areas, ranging into open woodland; marshes, along rivers, lakes, and ponds; nests high in tall tree in clearing or on forest woodland edge, usually in pine, cypress, or various deciduous trees		T
White-faced Ibis (*Plegadis chihi*) - prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats		T
White-tailed Hawk (*Buteo albicaudatus*) - near coast on prairies, cordgrass flats, and scrub-live oak; further inland on prairies, mesquite and oak savannas, and mixed savanna-chaparral; breeding March-May		T
Whooping Crane *(Grus americana)* - potential migrant; winters in and around Aransas National Wildlife Refuge and migrates to Canada for breeding; only remaining natural breeding population of this species	LE	E

	Federal Status	State Status
Wood Stork (*Mycteria americana*) - forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-water; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960		T
***** BIRDS-RELATED *****		
Colonial waterbird nesting areas - many rookeries active annually		
Migratory songbird fallout areas - oak mottes and other woods/thickets provide foraging/roosting sites for neotropical migratory songbirds		
*****FISHES*****		
American Eel (*Anguilla rostrata*) - most aquatic habitats with access to ocean; spawns January-February in ocean, larva move to coastal waters, metamorphose, then females move into freshwater; muddy bottoms, still waters, large streams, lakes; can travel overland in wet areas; males in brackish estuaries		
Sharpnose Shiner (*Notropis oxyrhynchus*) – endemic to Brazos River drainage; also, apparently introduced into adjacent Colorado River drainage; large turbid river, with bottom a combination of sand, gravel, and clay-mud	C1	
***** MAMMALS *****		
Black Bear (*Ursus americanus*) - within historical range of Louisiana Black Bear in eastern Texas, Black Bear is federally listed threatened and inhabits bottomland hardwoods and large tracts of undeveloped forested areas; in remainder of Texas, Black Bear is not federally listed and inhabits desert lowlands and high elevation forests and woodlands; dens in tree hollows, rock piles, cliff overhangs, caves, or under brush piles	T/SA; NL	T
Jaguarundi (*Herpailurus yaguarondi*) - thick brushlands, near water favored; six month gestation, young born twice per year in March and August	LE	E
Louisiana Black Bear (*Ursus americanus luteolus*) - possible as transient; bottomland hardwoods and large tracts of inaccessible forested areas	LT	T
Ocelot (*Leopardus pardalis*) - dense chaparral thickets; mesquite-thorn scrub and live oak mottes; avoids open areas; breeds and raises young June-November	LE	E
Plains Spotted Skunk (*Spilogale putorius interrupta*) – catholic in habitat; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie		
West Indian Manatee (*Trichechus manatus*) – Gulf and bay system; opportunistic, aquatic herbivore	LE	E
*****MOLLUSKS*****		
False Spike Mussel *(Quincuncina mitchelli)* - substrates of cobble and mud, with water lilies present; Rio Grande, Brazos, Colorado, and Guadalupe (historic) river basins		
Pistolgrip *(Tritogonia verrucosa)* - stable substrate, rock, hard mud, silt, and soft bottoms, often buried deeply; east and central Texas, Red through San Antonio River basins		
Rock-pocketbook (*Arcidens confragosus*) - mud, sand, and gravel substrates of medium to large rivers in standing or slow flowing water, may tolerate moderate currents and some reservoirs, east Texas, Red through Guadalupe River basins		

BRAZORIA COUNTY, cont'd

	Federal Status	State Status
Smooth Pimpleback *(Quadrula houstonensis)* - small to moderate streams and rivers as well as moderate size reservoirs; mixed mud, sand, and fine gravel, tolerates very slow to moderate flow rates, appears not to tolerate dramatic water level fluctuations, scoured bedrock substrates, or shifting sand bottoms, lower Trinity (questionable), Brazos, and Colorado River basins		
Texas Fawnsfoot *(Truncilla macrodon)* - little known; possibly rivers and larger streams, and intolerant of impoundment; flowing rice irrigation canals, possibly sand, gravel, and perhaps sandy-mud bottoms in moderate flows; Brazos and Colorado River basins		
***** REPTILES *****		
Atlantic Hawksbill Sea Turtle *(Eretmochelys imbricata)* - Gulf and bay system	LE	E
Green Sea Turtle *(Chelonia mydas)* - Gulf and bay system	LT	T
Gulf Saltmarsh Snake (*Nerodia clarkii*) - saline flats, coastal bays, & brackish river mouths		
Kemp's Ridley Sea Turtle *(Lepidochelys kempii)* - Gulf and bay system	LE	E
Leatherback Sea Turtle *(Dermochelys coriacea)* - Gulf and bay system	LE	E
Loggerhead Sea Turtle *(Caretta caretta)* - Gulf and bay system	LT	T
Smooth Green Snake (*Liochlorophis vernalis*) - Gulf Coastal Plain; mesic coastal shortgrass prairie vegetation; prefers dense vegetation		T
Texas Diamondback Terrapin (*Malaclemys terrapin littoralis*) - coastal marshes, tidal flats, coves, estuaries, and lagoons behind barrier beaches; brackish and salt water; burrows into mud when inactive; may venture into lowlands at high tide		
Texas Horned Lizard (*Phrynosoma cornutum*) - open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September		T
Timber/Canebrake Rattlesnake (*Crotalus horridus*) - swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil or black clay; prefers dense ground cover, i.e. grapevines or palmetto		T
***** VASCULAR PLANTS *****		
Coastal gay-feather *(Liatris bracteata)* - endemic; black clay soils of prairie remnants; flowering in fall		
Texas windmill-grass (*Chloris texensis*) - endemic; sandy to sandy loam soils in open to sometimes barren areas in prairies and grasslands, including ditches and roadsides; flowering in fall		
Threeflower broomweed *(Thurovia triflora)* - endemic; black clay soils of remnant grasslands, also tidal flats; flowering July-November		

Status Key:
- LE,LT - Federally Listed Endangered/Threatened
- PE,PT - Federally Proposed Endangered/Threatened
- E/SA,T/SA - Federally Endangered/Threatened by Similarity of Appearance
- C1 - Federal Candidate, Category 1; information supports proposing to list as endangered/threatened
- DL,PDL - Federally Delisted/Proposed for Delisting
- NL - Not Federally Listed
- E,T - State Endangered/Threatened
- "blank" - Rare, but with no regulatory listing status

Species appearing on these lists do not all share the same probability of occurrence. Some species are migrants or wintering residents only, or may be historic or considered extirpated.

GALVESTON COUNTY

	Federal Status	State Status
***** BIRDS *****		
Arctic Peregrine Falcon (*Falco peregrinus tundrius*) - potential migrant	DL	T
Attwater's Greater Prairie-chicken (*Tympanuchus cupido attwateri*) - open prairies of mostly thick grass one to three feet tall; from near sea level to 200 feet along coastal plain on upper two-thirds of Texas coast; males form communal display flocks during late winter-early spring; booming grounds important; breeding February-July	LE	E
Bald Eagle (*Haliaeetus leucocephalus*) - found primarily near seacoasts, rivers, and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds	LT-PDL	T
Black Rail (*Laterallus jamaicensis*) - salt, brackish, and freshwater marshes, pond borders, wet meadows, & grassy swamps; nests in or along edge of marsh, sometimes on damp ground, but usually on mat of previous year's dead grasses; nest usually hidden in marsh grass or at base of Salicornia		
Brown Pelican (*Pelecanus occidentalis*) - largely coastal and near shore areas, where it roosts on islands and spoil banks	LE	E
Henslow's Sparrow (*Ammodramus henslowii*) - wintering individuals (not flocks) found in weedy fields or cut-over areas where lots of bunch grasses occur along with vines and brambles; a key component is bare ground for running/walking; likely to occur, but few records within this county		
Mountain Plover (*Charadrius montanus*) - shortgrass plains and plowed fields (bare, dirt fields); primarily insectivorous; winter resident in this area		
Piping Plover (*Charadrius melodus*) - wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats	LT	T
Reddish Egret (*Egretta rufescens*) - resident of the Texas Gulf Coast; brackish marshes and shallow salt ponds and tidal flats; nests on ground or in trees or bushes, on dry coastal islands in brushy thickets of yucca and prickly pear		T
Snowy Plover (*Charadrius alexandrinus*) - wintering migrant along the Texas Gulf Coast beaches and bayside mud or salt flats		
Sooty Tern (*Sterna fuscata*) - predominately "on the wing"; does not dive, but snatches small fish and squid with bill as it flies or hovers over water; breeding April-July		T
Swallow-tailed Kite (*Elanoides forficatus*) - lowland forested regions, especially swampy areas, ranging into open woodland; marshes, along rivers, lakes, and ponds; nests high in tall tree in clearing or on forest woodland edge, usually in pine, cypress, or various deciduous trees		T
White-faced Ibis (*Plegadis chihi*) - prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats		T
White-tailed Hawk (*Buteo albicaudatus*) - near coast on prairies, cordgrass flats, and scrub-live oak; further inland on prairies, mesquite and oak savannas, and mixed savanna-chaparral; breeding March-May		T
Whooping Crane *(Grus americana*) - potential migrant; winters in and around Aransas National Wildlife Refuge and migrates to Canada for breeding; only remaining natural breeding population of this species	LE	E

	Federal Status	State Status
Wood Stork (*Mycteria americana*) - forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-water; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960		T
***** BIRDS-RELATED *****		
Colonial waterbird nesting areas - many rookeries active annually		
Migratory songbird fallout areas - oak mottes and other woods/thickets provide foraging/roosting sites for neotropical migratory songbirds		
*****FISHES*****		
American Eel (*Anguilla rostrata*) - most aquatic habitats with access to ocean; spawns January-February in ocean, larva move to coastal waters, metamorphose, then females move into freshwater; muddy bottoms, still waters, large streams, lakes; can travel overland in wet areas; males in brackish estuaries		
***** MAMMALS *****		
Black Bear (*Ursus americanus*) - within historical range of Louisiana Black Bear in eastern Texas, Black Bear is federally listed threatened and inhabits bottomland hardwoods and large tracts of undeveloped forested areas; in remainder of Texas, Black Bear is not federally listed and inhabits desert lowlands and high elevation forests and woodlands; dens in tree hollows, rock piles, cliff overhangs, caves, or under brush piles	T/SA; NL	T
Louisiana Black Bear (*Ursus americanus luteolus*) - possible as transient; bottomland hardwoods and large tracts of inaccessible forested areas	LT	T
Plains Spotted Skunk (*Spilogale putorius interrupta*) – catholic in habitat; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie		
West Indian Manatee (*Trichechus manatus*) – Gulf and bay system; opportunistic, aquatic herbivore	LE	E
***** MOLLUSKS *****		
Pistolgrip *(Tritogonia verrucosa)* - stable substrate, rock, hard mud, silt, and soft bottoms, often buried deeply; east and central Texas, Red through San Antonio River basins		
***** REPTILES *****		
Alligator Snapping Turtle (*Macrochelys temminckii*) - deep water of rivers, canals, lakes, and oxbows; also swamps, bayous, and ponds near deep running water; sometimes enters brackish coastal waters; usually in water with mud bottom and abundant aquatic vegetation; may migrate several miles along rivers; active March-October; breeds April-October		T
Atlantic Hawksbill Sea Turtle (*Eretmochelys imbricata*) - Gulf and bay system	LE	E
Green Sea Turtle (*Chelonia mydas*) - Gulf and bay system	LT	T

GALVESTON COUNTY Cont'd

	Federal Status	State Status
Gulf Saltmarsh Snake (*Nerodia clarkii*) - saline flats, coastal bays, & brackish river mouths		
Kemp's Ridley Sea Turtle (*Lepidochelys kempii*) – Gulf and bay system	LE	E
Leatherback Sea Turtle (*Dermochelys coriacea*) - Gulf and bay system	LE	E
Loggerhead Sea Turtle (*Caretta caretta*) - Gulf and bay system	LT	T
Smooth Green Snake (*Liochlorophis vernalis*) - Gulf Coastal Plain; mesic coastal shortgrass prairie vegetation; prefers dense vegetation		T
Texas Diamondback Terrapin (*Malaclemys terrapin littoralis*) - coastal marshes, tidal flats, coves, estuaries, and lagoons behind barrier beaches; brackish and salt water; burrows into mud when inactive; may venture into lowlands at high tide		
Texas Horned Lizard (*Phrynosoma cornutum*) - open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September		T
Timber/Canebrake Rattlesnake (*Crotalus horridus*) – swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil or black clay; prefers dense ground cover, i.e. grapevines or palmetto		T

*** VASCULAR PLANTS ***

Coastal gay-feather (*Liatris bracteata*) - endemic; black clay soils of prairie remnants; flowering in fall

Correll's false dragon-head (*Physostegia correllii*) – wet soils including roadside ditches and irrigation channels; flowering June-July

Grand Prairie evening primrose (*Oenothera pilosella* ssp. *sessilis*) known in Texas from a single collection made in the 1850's from Galveston Island; elsewhere known from sandy soils in low rises in Mississippi Delta; flowering May-June

Houston daisy (*Rayjacksonia aurea*) - endemic; seasonally wet, saline barren areas, around the base of mima mounds in coastal prairies, or barren to somewhat vegetated openings in grasslands, including pastures and roadsides, on loamy to sandy loam soils; flowering October-November

Texas windmill-grass (*Chloris texensis*) - endemic; sandy to sandy loam soils in open to sometimes barren areas in prairies and grasslands, including ditches and roadsides; flowering in fall

Threeflower broomweed *(Thurovia triflora*) - endemic; black clay soils of remnant grasslands, also tidal flats; flowering July-November

Status Key:

LE, LT	- Federally Listed Endangered/Threatened
PE, PT	- Federally Proposed Endangered/Threatened
E/SA, T/SA	- Federally Listed Endangered/Threatened by Similarity of Appearance
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E, T	- State Listed Endangered/Threatened
"blank"	- Rare, but with no regulatory listing status

Species appearing on these lists do not all share the same probability of occurrence. Some species are migrants or wintering residents only, or may be historic or considered extirpated.

Element Occurrence Record

Scientific Name: Haliaeetus leucocephalus
Occurrence #: 120
Eo Id: 4018
Common Name: Bald Eagle
TX Protection Status: T
Global Rank: G4
State Rank: S3B,S3N
Federal Status: LT-PDL

Location Information:

Watershed:

12040205 - Austin-Oyster

County Name:	State:	Mapsheet:
Brazoria	TX	29095-A3, Oyster Creek 29095-A4, Lake Jackson 28095-H3, Freeport 28095-H4, Jones Creek

Directions

TERRITORY EAST-NORTHEAST OF CLUTE ON OYSTER CREEK AND BIG SLOUGH

Survey Information:

First Observation: 2000
Survey Date:
Last Observation: 2001
Eo Type:
Eo Rank:
Eo Rank Date:
Observed Area:

Comments:

General Description:

Comments: TPWD NEST #020-8A

Protection Comments:

Management Comments:

Data:

EO Data: NEST #020-8A: 2000, ACTIVE NEST WITH ONE YOUNG FLEDGED; 2001, ACTIVE NEST WITH TWO YOUNG FLEDGED

Site:

Site Name:

BRAZOS-SAN BERNARD-COLORADO RIVERS MEGASITE

Element Occurrence Record

Managed Area:

Managed Area Name

Reference:

Citation:

ORTEGO, BRENT. 2001. PERFORMANCE REPORT. PROJECT NO. 10: BALD EAGLE NEST SURVEY AND MANAGEMENT. FEDERAL AID GRANT NO. W-125-R-12. SEPTEMBER 30, 2001.

ORTEGO, BRENT. 2002. MAPS CLARIFYING QUESTIONS ABOUT BALD EAGLE TERRITORY LOCATIONS FROM THE 2001 SURVEY. RECEIVED JUNE 13, 2002.

POLASEK, LEN G. 2000. PERFORMANCE REPORT. PROJECT NO. 10: BALD EAGLE NEST SURVEY AND MANAGEMENT. FEDERAL AID GRANT NO. W-125-R-11. AUGUST 31, 2000.

Specimen:

TPWD Pipeline Monitoring Protocol

The permittee will use aerial photography with GIS analysis to monitor the entire pipeline construction corridor and an additional 200 meter buffer zone (100 meters paralleling each side of the construction corridor). The purpose of the GIS analysis is to quantify habitat conversion, particularly emergent marsh to open water. The resource agencies recommend the following GIS/ Remote Sensing method and standard be used in order to produce accurate and consistent results.

The pipeline corridor will be monitored by providing pre- and post- construction aerial photography, (taken 24 months after construction completion to allow for vegetative re-grow) at a scale of 1: 4800 or 1 inch to 400 feet. The applicant will then be required to utilize GIS and Remote Sensing techniques to conduct an analysis of change to determine the amount of vegetated marsh impacted by pipeline construction activities. Monitoring reports should be submitted by the applicant that includes at a minimum:

1) a pre-project GIS analysis assessing the existing emergent marsh to open water ratio, in acres, within the permitted corridor (which includes the construction corridor and the 200 meter buffer zone).
2) a post -project GIS analysis assessing the emergent marsh to open water ratio, in acres, within the entire permitted corridor (which includes the construction corridor and the 200 buffer zone),
3) Ortho corrected imagery covering the construction corridor and buffer zone, maximum of 6 inch pixel size and CIR imagery, +/- 2 meters spatial accuracy, 4) All vector deliverable to be in Arcview Shapefile format with FGDC compliant metadata and all raster imagery in GEoTiff format with FGDC compliant metadata. A binary classification system should be used consisting of open water and vegetated areas. The classified data should meet or exceed 90% attribute accuracy as determined by industry standard and be verified by statistically valid ground truth sampling techniques, this can include GPS based ground surveys.